Application No.: 10/649,706 Docket No.: 22270-00001-US1

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Original) A clock multiplier, comprising:

a first clock multiplication circuit for multiplying the frequency of an input clock based on a delay time;

an inverter for inverting the output clock of the first clock multiplication circuit;

a first low pass filter connected to the output of the inverter;

a second low pass filter connected to the output of the first clock multiplication circuit; and

an amplifier for comparing the output voltages of the first low pass filter and the second low pass filter so as to feedback-control the delay time of the first clock multiplication circuit.

2. (Original) The clock multiplier in accordance with Claim 1, wherein the first clock multiplication circuit comprises:

a first voltage-controlled delay line for delaying the input clock by the delay time; and

a first exclusive OR (XOR) gate connected to the input clock and the output of the first voltage-controlled delay line.

3. (Original) The clock multiplier in accordance with Claim 2, wherein the first voltage-controlled delay line is operative to delay the input clock by one-fourth period of the input clock.

4. (Original) The clock multiplier in accordance with Claim 2, which is a clock doubler.

5. (Original) The clock multiplier in accordance with Claim 1, wherein the duty cycle of the output clock of the first clock multiplication circuit is approximately 50%.

6. (Original) The clock multiplier in accordance with Claim 1, wherein the first clock multiplication circuit comprises:

a first voltage-controlled delay line for delaying the input clock by the delay time;

an XOR gate connected to the input clock and the output of the first voltage-controlled delay line;

a second voltage-controlled delay line for delaying the output clock of the first voltage-controlled delay line by the delay time; and

an exclusive NOR (XNOR) gate connected to the outputs of the XOR gate and the second voltage-controlled delay line.

7. (Original) The clock multiplier in accordance with Claim 6, wherein the first voltage-controlled delay line and the second voltage-controlled delay line respectively delay the input clock and the output clock of the first voltage-controlled delay line by one-sixth period of the input clock.

8. (Original) The clock multiplier in accordance with Claim 6, which is a 3X clock multiplier.

9. (Original) The clock multiplier in accordance with Claim 2, further comprising a second clock multiplication circuit, which comprises:

a second voltage-controlled delay line for delaying the output of the first XOR gate by the delay time; and

a second XOR gate connected to the outputs of the first XOR gate and the second voltage-controlled delay line.

10. (Original) The clock multiplier in accordance with Claim 9, wherein the first voltage-controlled delay line and the second voltage-controlled delay line respectively delay the input clock and the output clock of the first XOR gate by one-fourth period and one-eighth period of the input clock.

11. (Original) The clock multiplier in accordance with Claim 9, which is a 4X clock multiplier.

12. (Original) The clock multiplier in accordance with Claim 10, wherein the first voltage-controlled delay line is constituted by a third voltage-controlled delay line and a fourth voltage-controlled delay line connected in series, and the third voltage-controlled delay line and the fourth voltage-controlled delay line individually delay the input clock by one-eighth period of the input clock.

13. (Currently amended) A clock multiplier, comprising:

a first clock multiplication circuit for multiplying the frequency of an input clock based on a delay time;

a second low pass filter connected to the output of the first clock multiplication circuit;

an amplifier for comparing a one-half supply voltage and the output voltage of the second low pass filter so as to feedback-control the delay time of the first clock multiplication circuit; and

a second clock multiplication circuit, which comprises:

a second voltage-controlled delay line for delaying the output of ~~the~~ a first XOR gate by the delay time; and

a second XOR gate connected to the outputs of the first XOR gate and the second voltage-controlled delay line.

14. (Currently amended) The clock multiplier in accordance with Claim 13, wherein the first clock multiplication circuit comprises:

a first voltage-controlled delay line for delaying the input clock by the delay time; ~~and,~~

~~a~~ wherein the first XOR gate is connected to the input clock and the output of the first voltage-controlled delay line.

15. (Original) The clock multiplier in accordance with Claim 13, wherein the duty cycle of the output clock of the first clock multiplication circuit is approximately 50%.

16. (Previously presented) A clock multiplier, comprising:

a first clock multiplication circuit for multiplying the frequency of an input clock based on a delay time;

a second low pass filter connected to the output of the first clock multiplication circuit; and

an amplifier for comparing a one-half supply voltage and the output voltage of the second low pass filter so as to feedback-control the delay time of the first clock multiplication circuit,

wherein the first clock multiplication circuit comprises:

a first voltage-controlled delay line for delaying the input clock by the delay time;

an XOR gate connected to the input clock and the output of the first voltage-controlled delay line;

a second voltage-controlled delay line for delaying the output of the first voltage-controlled delay line by the delay time; and

an XNOR gate connected to the outputs of the XOR gate and the second voltage-controlled delay line.

Claim 17: (Canceled)

18. (Previously presented) The clock multiplier in accordance with Claim 16, wherein the duty cycle of the output clock of the first clock multiplication circuit is approximately 50%.